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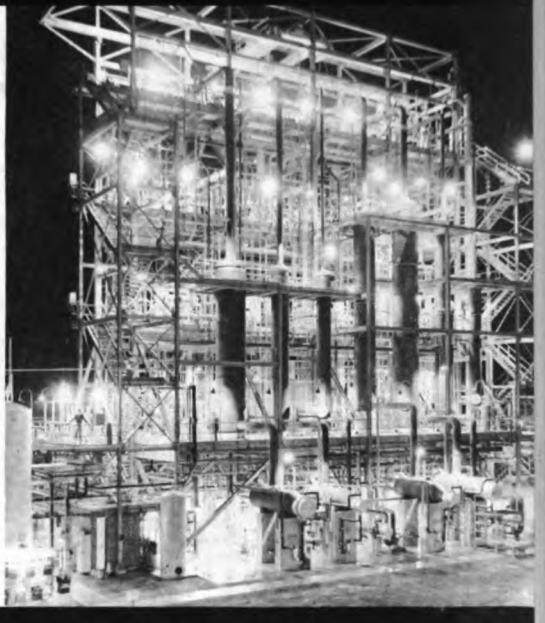
MONSANTO

1956 ANNUAL REPORT



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MONSANTO CHEMICAL COMPANY

COMPARATIVE FINANCIAL REVIEW

	1956	1955	Increase Decrease
Income:			
From sale of our products	$541,883,474	$522,349,097	$19,534,377
From licenses, dividends, interest, etc.	4,983,376	3,383,584	1,599,792
Our total income was	$546,866,850	$525,732,681	$21,134,169
Deductions from Income:			
For raw materials, fuel, supplies, etc.	$315,256,517	$297,433,549	$17,822,968
For depreciation, obsolescence, depletion	38,449,184	35,029,074	3,420,110
For interest on long term debt	5,406,354	4,870,732	535,622
These expenses totaled	$359,112,055	$337,333,355	$21,778,700
Which left	$187,754,795	$188,399,326	$ 644,531
Distribution of Balance:			
To employes	$110,673,902	$101,958,805	$ 8,715,097
To shareowners as cash dividends	20,992,343	20,800,520	191,823
For taxes	38,435,360	44,270,551	5,835,191
Retained for future growth	17,653,190	21,369,450	3,716,260
Per Share of Common Stock:			
Net income	$ 1.80	$ 1.98	$ .18
Cash dividends paid	1.00	.91⅔	.08⅓
Book value	16.93	16.42	.51
Common Shares Outstanding	21,446,461	20,998,945	447,516

MONSANTO 1956 ANNUAL REPORT

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COVER ILLUSTRATION: Pictures taken from the Annual Review, which accompanies this 1956 Annual Report.

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TO THE SHAREOWNERS

Although during the year under review our national economy surged forward, Monsanto participated only in greater sales, which increased 3.7 per cent over those of the prior year. Major contributors were plastics and inorganic chemicals. Profits fell short of our hopes and expectations; net earnings available to the common stock decreased 7.1 per cent.

However, if effect is given to Lion Oil's earnings in prior years and to our equities in the undistributed earnings of subsidiary and associated companies, 1956 earnings suffer by comparison with those of but one year—1955.

Nevertheless, under conditions such as prevailed, Monsanto's organization and facilities are capable of a far better result. An aggregate of unfavorable circumstances prevented its realization. Before proceeding to a review of the year's substantial progress, the most important of these adverse circumstances will be scrutinized. In magnitude, the greatest was the failure of the components of Lion Oil Company, which was merged into Monsanto in the fall of 1955, and especially its ammonia component, to equal their previous high earnings.

Ammonia: When the merger was negotiated, Lion was engaged in two major activities: production of ammonia and its derivatives, and production, refining and sale, partly through its own retail outlets, of petroleum and its derivatives.

Lion had been selling but 80 per cent of its ammonia capacity, but at profitable prices, in the agricultural field. More ammonia capacity was under construction by other companies. It was anticipated that, as a result, Lion's ammonia sales would decrease and that lower prices would prevail. Monsanto and its associated companies are large consumers of ammonia, however, and it was reasoned that our requirements, if taken from Lion, would compensate in good measure for the revenue to be lost from anticipated adverse developments.

Drouth, crop curtailment and the relatively unhappy condition of agriculture contributed to a sharper-than-expected drop in ammonia sales and selling prices. Existing contracts prevented Monsanto and its associates from withdrawing their full needs from Lion's facilities. Hence its operations were maintained at 75 per cent of capacity only because large quantities were sold in world markets, where sales, however, realized unsatisfactory prices.

On July first, sales of ammonia and its derivatives were transferred from Lion to the Inorganic Chemicals Division, whose sales organization cultivates not only agricultural but industrial markets. An intensive effort is being made to secure a larger portion of the former; important new outlets have already been secured in the latter. Furthermore, it is estimated that Monsanto and its associated companies will progressively increase their withdrawals from less than seven per cent of Lion's capacity in 1956 to more than 20 per cent in 1958.

Lion's petroleum operations constitute 17 per cent of the company's assets and its sales—net of purchases—equal about nine per cent of the company's consolidated sales. Profits from these operations would have approximated those of 1955 had it not been for a three-month strike at the El Dorado, Arkansas, refinery, an increased research program designed to develop processes to convert petroleum products into chemical raw materials, and an increased program looking to the expansion of the division's oil and gas reserves.

Polyethylene, Methanol, Acrylonitrile: We reported last year that most of the teething troubles of our polyethylene and methanol plants were overcome—an assertion which subsequent experience did not confirm. Both plants operated at substantial losses. Unlike those of other companies which entered recently into polyethylene manufacture, our plant was engineered on data which had been proved only in pilot plant. Being our first venture into ultra-high pressure technology, polyethylene presented formidable problems in attaining the design rate of production of satisfactory qualities. By the year end, however, design rates of production had been achieved and considerable progress had been made in developing a range of products meeting ever-more-exacting market standards. Furthermore, our laboratories have demonstrated a process change which promises excellent quality and greater throughput. Equipment for a partial changeover to the new process is scheduled to operate by midyear.

The methanol plant is owned jointly with the Heyden Chemical Company. Our share of the output is required in our plastics operations. It was designed and erected in our Texas City plant by an engineering firm of wide experience and excellent reputation. Our contract with the firm embodies performance guarantees which the completed plant failed to meet. Repeated shutdowns, due to failures and modifications, interrupted production until the last quarter, when a sustained output was realized. Both the contractors and Monsanto are working intensively on the process.

Our Texas City acrylonitrile plant, which was erected in 1952 to supply raw material for Chemstrand's fiber, *Acrilan*, has never yielded adequate profits, due, in the main, to Chemstrand's low withdrawals. However, the improved outlook for *Acrilan* (which is detailed later in our Chemstrand comments) and other recently secured acrylonitrile outlets promise capacity or near-capacity and profitable operation in 1957.

The external influence: Increased wages and fringe benefits not only raised our conversion and construction costs but also increased prices of many raw materials, factors which technological improvements did not wholly offset. Because of contract commitments, realization of price increases on some of our products lagged; others will not become effective until this year.

Imports, especially from West Germany, of some plastics and organic chemicals captured substantial parts of our domestic market for these products but the adverse effect on profits was greater than indicated by the quantities imported. Tariffs have been slashed on most of these products by 50 per cent or more. Many are standard articles of commerce; hence the prices at which foreigners are willing to sell in the American market fix maximum prices in the American market. As a result, profits are, figuratively, being ground between an upper stone, the level of which is set by foreign costs and a nether one, inched higher and higher by internal inflationary forces.

Last year, potential profits that were unrealized *solely* because of slashed tariffs exceeded $5,000,000; potential profits which were unrealized *in part* because of slashed tariffs approximated another $3,000,000.

ORGANIC CHEMICALS

Oil Additives: New products include *Santopoid 22* and *22-RI*, multi-purpose gear oil additives, both of which meet the more stringent specifications which soon will be established for gear oils. *Santolube 393*, a new oxidation inhibitor for motor oil, was introduced in September. An oil detergent—*Santolube 333*—was developed for use with suitable antioxidants for reducing carbon deposits and ring-sticking tendencies, and for combating sludge and lacquer formation in car engines.

Functional Fluids: *Pydraul AC*, a new fire-resistant air-compressor lubricant, minimizes hazards of explosion and fire associated with lubrication of air compressors. *Skydrol 500*, a new fire-resistant aircraft hydraulic fluid, will be used in hydraulic systems designed to operate at extremely low temperatures and will be used in jet airliners—Douglas DC-8 and Boeing 707. Also new was *OS-45*, a coolant for electronic equipment and high-speed jet aircraft requiring operation over the extreme temperature range of −65°F to 450°F.

Plasticizers: Our phthalate ester capacity at Everett, Massachusetts, was expanded by 50 per cent, supplementing production in St. Louis. A new plasticizer—*Santicizer 213*—has been well accepted by the vinyl plastics industry, particularly in the rapidly growing field of plastisols which are used in vinyl foams, paper coatings and flexible toys. Another new plasticizer—*Santicizer 214*—has advantages over others in use as it prevents sticking of compounds to molds, a characteristic which makes it particularly attractive in the manufacture of complicated objects.

Agricultural Chemicals: During the year we established the Monsanto "M"—labeled formulated weed killers in retail packages in the farm markets of 18 states. We shall expand into other areas this year. We introduced methyl parathion, a phosphorus type insecticide effective on insects such as boll weevils which have become resistant to the chlorinated hydrocarbon insecticides hitherto used. *Randox*, our new chemical pre-emergence grass killer, met with an encouraging response. *Vegadex*, a pre-emergence weed killer, was announced. The Department of Agriculture has approved both.

Fine Chemicals: Two newly developed bacteriostats which prevent bacteria from growing on human skin have been adopted by large soap companies in deodorant toilet soaps.

Our over-all effort in feed and veterinary chemicals is beginning to be justified: a beneficent supplement for poultry feeds, trade-named *MHA*, is being well re-

ceived. Sales are expected to grow. The value of our glycine in animal nutrition was demonstrated; it is being marketed in test quantities.

Facilities for vanillin refining were completed at our Seattle, Washington, plant, consolidating this operation and improving costs.

Paper Chemicals: A new *Mersize* plant operation started at Fieldsboro, New Jersey, bettering our service to Eastern paper mills.

Intermediates: Our paranitroaniline and organic amines plants were expanded.

Rubber Chemicals: *Elastopar*, a modifier for butyl rubber, was announced and will undergo large-scale testing by manufacturers of tire and rubber products. We synthesized *Elastopar* during the course of a cooperative effort with the Esso Research and Engineering Corporation, producer of butyl rubber, to overcome previous limitations to the use of this type rubber. *Elastopar* has an important potential. Expansions were completed for the manufacture of the relatively new rubber antioxidants—*Santoflex AW* and *Santocure NS*—and to supply raw material for the latter, a tertiary butyl amine plant was completed at Texas City.

Resins Materials: Substantial additions were made to phthalic and maleic anhydride plants. As previously reported, an adipic acid plant is being built at Luling, Louisiana; it will be in production early this year. Among important uses for adipic acid are the isocyanate compounds being produced by our associate, the Mobay Chemical Company. The year saw initial production of *Bisphenol "A"*, an ingredient for epoxy resins, which have excellent bonding properties; their use in surface coatings is growing.

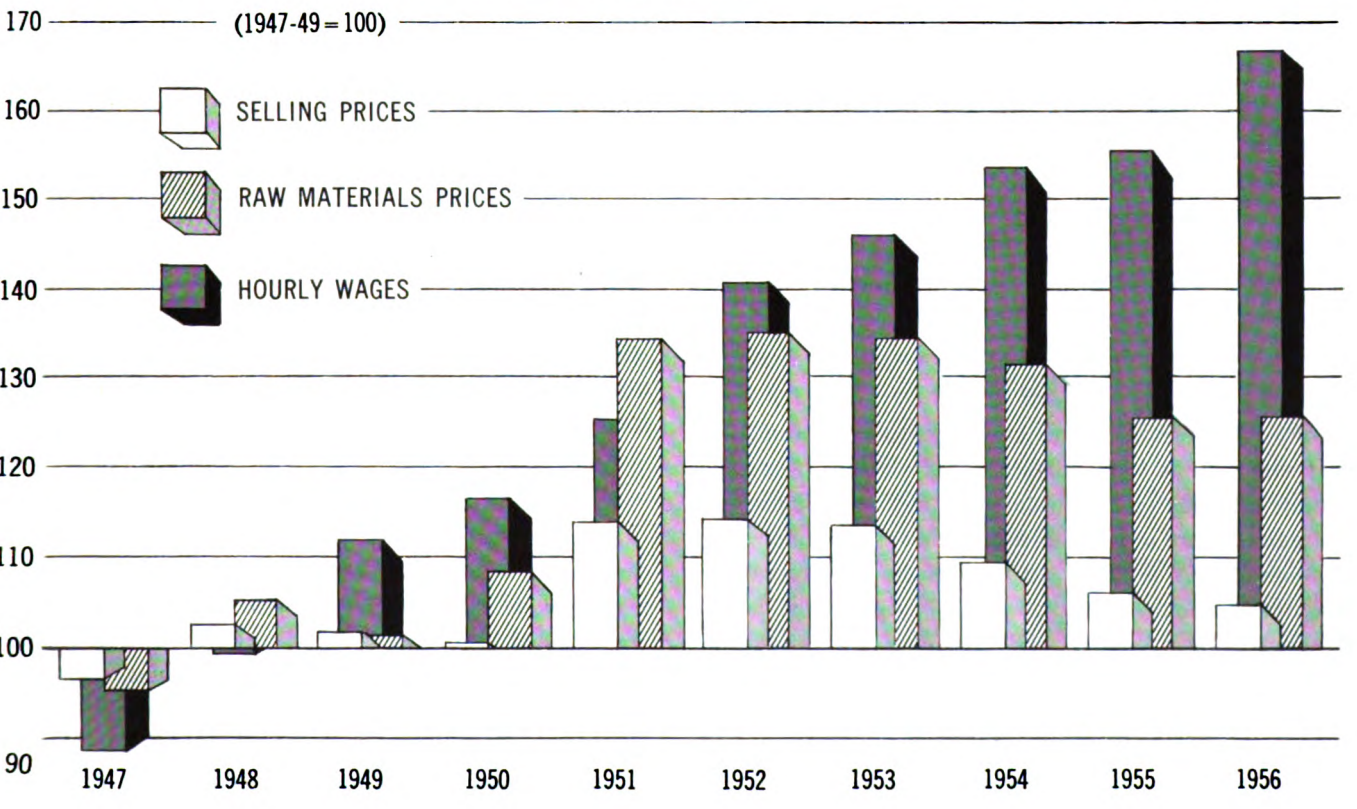
INORGANIC CHEMICALS

At Monsanto, Tennessee, new kilns for nodulized furnace charges are in operation; costs are benefiting; phosphorus capacity was increased some 20 per cent by the addition of a 45,000-kva transformer.

At Monsanto, Illinois, substantial improvements were made in the process for dodecylbenzene, an important synthetic detergent ingredient. Phosphorus pentasulfide capacity was expanded.

The Kearny, New Jersey, plant which started up late in 1955, using an entirely new process for sodium tripolyphosphate, is operating satisfactorily. Facilities were added to produce and package *"all"*.

NDEX OF MONSANTO'S SELLING PRICES, RAW MATERIALS COSTS AND HOURLY WAGES



At Trenton, Michigan, capacities for monosodium phosphate, soluble and insoluble metaphosphates and sodium acid pyrophosphates were enlarged. A plant was constructed to produce dense granular sodium tripolyphosphate.

At Carondelet, in St. Louis, calcium phosphate capacity was increased; new facilities were installed for producing potassium phosphates. Part of the Anniston, Alabama, chlorine-caustic soda plant was converted to produce caustic potash, a raw material for potassium phosphates.

At Pueblo, Colorado, a new, small, efficient package-type phosphoric acid plant was built to supply the requirements of the Colorado Fuel and Iron Company. Ammonia is scrubbed from coke oven gases in phosphoric acid to produce diammonium phosphate—a fertilizer.

New inorganic chemicals included a polymerized ethyl silicate, a special phosphate for the dentifrice industry and a new silica aquasol for wax and textile applications.

CONSUMER PRODUCTS

Sales of consumer products, of which the controlled suds detergent "*all*" is the dominant member, decreased approximately nine per cent in a highly competitive market. This group is not unprofitable and it provides a substantial outlet for the products of other divisions. However, we face the reality that our consumer products line is not now broad enough to support a completely competitive merchandising organization.

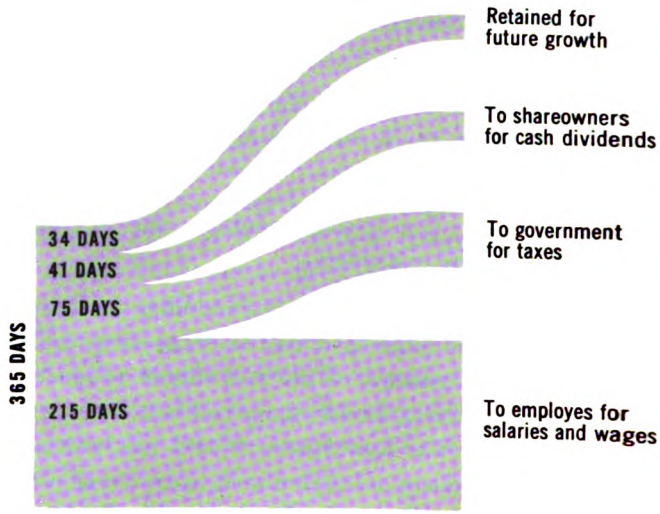
Although the Consumer Products Division has been diligent, it has been unable to develop unique products of major promise. Every avenue which promises to lead to an enhancement of the group's prospects has been and will be explored thoroughly.

PLASTICS

Major expansions in general-purpose and plastisol-type vinyl resins were completed, providing a greater volume of these versatile materials, which find use in the manufacture of film, sheeting, floor tile, wire-covering compounds, phonograph records and garden hose. The development of vinyl sheeting in rigid form, both transparent and opaque, will broaden this product's markets.

The new *Saflex* safety-glass interlayer plant at Trenton, Michigan, was completed and staffed at year end. The use of colored, gradated *Saflex* in windshields

NUMBER OF DAYS OPERATING INCOME REQUIRED FOR PAYROLL, TAXES AND DIVIDENDS, YEAR 1956



to lessen glare and diminish heat transmission has been accelerated by wider adoption of car air conditioning systems. Its use in glass laminate paneling for construction is increasing.

Considerable effort was concentrated on expandable polystyrene for use in low-temperature insulation, construction, electronics and paper-laminated shipping containers. The last, a cooperative development with the St. Regis Paper Company, has exciting possibilities. These containers should cost less than those made from wood and slightly more than conventional corrugated paper containers—yet they are lighter and sturdier than either and moisture-proof as well.

Lytron Latex 680, a new latex binder for use in the manufacture of durable interior and exterior latex paints, was adopted by several paint manufacturers and introduced by them to the public. Facilities for its manufacture were completed at our Santa Clara, California, and Springfield, Massachusetts, plants.

PETROLEUM OPERATIONS

Exploration and drilling activities were accelerated. Successful wildcat wells were completed in Texas, Colorado, Oklahoma and Kansas. Development wells were drilled in these states and in Louisiana, Arkansas and New Mexico. Within the United States, Lion Oil participated in the drilling of 191 gross wells, of which its ownership was equivalent to 120.4 net wells. Of these, 67 gross or 40.2 net produced oil and 19 gross

or 11.9 net produced gas. Oil and gas reserves increased substantially in excess of withdrawals. An aggressive exploration program will be continued.

Lion extended its activities into foreign lands. By invitation of Italy's Societa Edison, with which we are associated in Italian chemical production, we participate to the extent of 45 per cent in the exploration, development and operation of promising concessions approximating 780,000 acres in Sicily. Three exploratory wells are now being drilled on this Mediterranean island.

Lion acquired a 15 per cent interest in a 2,000-acre exploitation concession in Venezuela's oil-rich Lake Maracaibo. Drilling will start during the early part of 1957. Lion also has a five per cent interest in sizable concessions in Spain on which drilling is being conducted.

Arrangements were made to provide substantial savings by piping a large volume of natural gas to our Texas City plant from Lion's reserves in Brazoria County, 40 miles distant.

The transfer of much of the chemical phases of the division to the Inorganic Chemicals Division permits the Lion organization to concentrate on petroleum phases of our business. As was the intention when the Monsanto-Lion merger was conceived, the oil division is continuing to prepare itself to manufacture large quantities of petroleum raw materials needed now and in the future for many of the company's major chemical products.

Soon after the turn of the year, prices of petroleum and its derivatives were increased in Lion's marketing area. If maintained, they will be reflected in better earnings.

CHEMSTRAND'S OUTLOOK PROMISING

The Chemstrand Corporation, which is owned jointly by Monsanto and American Viscose Corporation, produces nylon and *Acrilan*, an acrylic fiber. In May, E. A. O'Neal Jr., a Monsanto director and chairman of Monsanto Chemicals Limited, resigned these posts to become president of Chemstrand.

Drastic price reductions averaging 15 per cent, which were effective in January, reduced Chemstrand's 1956 after-tax profits to $12,195,000. Net profits on a smaller volume in 1955 were $14,068,000 after providing for usual income taxes. In December, however, nylon prices were advanced five per cent on all deniers except tire yarn.

Nylon: Current prices have expanded market potentials, especially in automotive tires. In today's automobiles of great power and high speed, nylon cord provides desirable shock and bruise resistance. Almost all commercial airplane tires are made of nylon, a tribute to its performance where these characteristics are a prime requisite. We expect this use of nylon will continue to expand.

New texturizing processes offer nylon yarn a re-entry into a variety of apparel fields which have been dominated by the acrylic fibers—*Orlon* and *Acrilan*. Texturizing changes the physical appearance and the feel of nylon, making it fuller, softer, richer and easier to care for.

Recently introduced circular knitting of nylon produces lingerie and underwear combining nylon's durability and easy-care features with wearing comfort. Nylon stretch yarns caused a revolution in men's and women's hosiery by providing a perfect fit for every individual and reducing the necessity for manufacturers and merchants to inventory many sizes.

Continued expansion of nylon's use in durable goods seems assured. Nylon-reinforced bellows springing is now used in trucks and buses; we expect it soon will be available in automobiles.

Chemstrand is preparing to secure its share of these markets.

Reflecting the completion last April of a 9,000,000-pound tire yarn addition, Chemstrand's Pensacola, Florida, plant's annual capacity for all nylon yarn has been raised to slightly over 58,000,000 pounds. Additional facilities for both tire and textile yarns, now under construction there, are scheduled for operation in the spring of 1958. Then Chemstrand's annual capacity will be raised to 114,000,000 pounds. No further expansion at the Pensacola plant is now contemplated.

These and other authorized expenditures at both Pensacola, Florida, and Decatur, Alabama, will increase Chemstrand's employed capital about $120,000,000 over the initial investment. Of this sum, approximately $25,000,000 has been provided by five-year bank loans; the balance has been and is expected to be generated by Chemstrand's internal sources.

Chemstrand's technical developments last year included *Chem-nyle* dyeing. This process, involving a novel chemical addition to dye baths, eliminates dye streaking, which hitherto limited the use of nylon in some fabrics. All important mills have requested licenses to use the process; they predict that *Chem-nyle* dyeing will broaden nylon's uses.

Acrilan: At long last *Acrilan*, Chemstrand's acrylic fiber, seems destined to justify our faith in it. With all important known technical problems solved, sales momentum is increasing rapidly. After several years of substantial losses, Chemstrand has budgeted the *Acrilan* plant to reach capacity operation during this year.

A new *white Acrilan* will be in commercial production in March from new plant additions at Decatur and will provide a fiber which is entirely suitable, among other uses, for dyeing in pastels. It will be sold as a companion product to standard *Acrilan*.

Acrilan is finding increasing consumption in jersey fabrics, sweaters, men's and women's outer garments, and blankets, including electric blankets.

Production has started on *Acrilan* carpets; carpet manufacturers have placed substantial orders; deliveries started in February, 1957.

A wholly owned British subsidiary, Chemstrand Limited, was formed to make and sell *Acrilan* in the British Empire. In October, contracts were let for construction, at Coleraine, Northern Ireland, of the manufacturing plant. Acceptance by British mills of *Acrilan* imported from Decatur has been gratifying.

Negotiations are under way also for *Acrilan* manufacture in partnership with established synthetic fiber producers in other nations.

Chemstrand maintains, in both its Pensacola nylon and its Decatur *Acrilan* plants, teams of chemists and engineers who work directly with production personnel in process and product improvement. In addition, 410 people, of whom 175 are scientists, are engaged in the Decatur research laboratories seeking better methods of manufacturing, dyeing and fabricating both nylon and *Acrilan;* they are exploring, also, non-woven fibers and polymers of new compositions from which new synthetics can be spun, for, just as in plastics, no one fiber has inherent characteristics that meet all the varying requirements of many differing uses for textiles.

MOBAY'S STATUS

Mobay Chemical Company, which is owned jointly with the eminent Farbenfabriken Bayer of Leverkusen, Germany, completed construction last spring of the first unit of its New Martinsville, West Virginia, plant. Difficult problems were encountered in transferring German application technique to the American market, where requirements differ from those of the Continent. Hence Mobay maintained a costly research and application program which the 1956 sales volume could not support profitably. However, the year's technical improvements have, in the opinion of Mobay's management, increased market potentials, and sales are moving upward; Mobay's customer licensees are increasing their output of urethane foam for use as a carpet underlay, in furniture upholstery and as a clothing interliner. Crash pads and safety sun visors in most 1957 automobiles are made from urethane foam.

In addition, Mobay continued development of the use of urethane surface coatings, wire enamel and adhesives. All show substantial promise.

Mobay's products are also used for *Vulcollan*, a solid, rubber-like material which has unusual abrasion-resistance and high resilience. As an example, hammers with *Vulcollan* heads provide dramatic demonstrations. They drive nails into wood as readily as conventional ones; yet a desk top hit by one with full force remains unmarred. These properties make it attractive for many uses, especially automotive, where vibration absorbency is important. Mobay is licensing customers to produce *Vulcollan*, supplying raw materials for its manufacture by import until its New Martinsville plant is producing them.

SHAWINIGAN RESINS

Shawinigan Resins Corporation, which is owned jointly with Shawinigan Chemicals Limited of Shawinigan Falls, Canada, produces synthetic resins used in surface coatings, wire coatings and safety glass interlayers. The capacity of its Springfield, Massachusetts, plant, adjacent to that of the Plastics Division, became taxed and facilities are being constructed in our Trenton, Michigan, plant where the Plastics Division has erected another safety glass interlayer plant. Shawinigan's Trenton plant should be operating in April. Shawinigan had another profitable year.

OVERSEAS

Sales of all important overseas subsidiaries and affiliates exceeded those of 1955; all operated profitably.

Plants in England, Japan, Canada, Mexico, Spain and Italy were expanded. In December, Monsanto Argentina, S. A. I. C., wholly owned, completed construction of the first polystyrene plant in Argentina. Our Japanese associate, 50 per cent owned Monsanto Kasei, completed construction of facilities for polystyrene and started production in January. Work proceeds in Spain, through our affiliate, Etino-Quimica, S. A., 25 per cent owned, on a polystyrene plant which

should be completed this year. In September, Monsanto Canada Limited, 100 per cent owned, commenced production in its new synthetic resins plant in Edmonton, Alberta. Monsanto Mexicana, S. A., 100 per cent owned, started production of sulfuric acid and aspirin.

Monsanto Chemicals (Australia) Limited completed a new plant for polyvinyl acetate, as well as a new research building.

Monsanto Chemicals Limited in England, in which we hold two-thirds of the common shares, had record sales, but its lower net profit reflects the impact of keen international competition. New plants in Newport for maleic anhydride and cyclohexylamine were completed. Monsanto House, one of London's most modern office buildings, was occupied.

A new plant site was acquired adjacent to the refinery of Esso Petroleum Ltd., at Fawley, a Southhampton suburb. The refinery's off-gases will be used by Monsanto Chemicals Limited as raw materials for petrochemical manufacture. Erection of a polyethylene plant on this site will start this year. The Fawley project will require financing. It is contemplated that a part will take the form of common shares. If financing proceeds in this manner, it is our intention to subscribe for our allotment of common shares, thus retaining our ownership of two-thirds of the outstanding common.

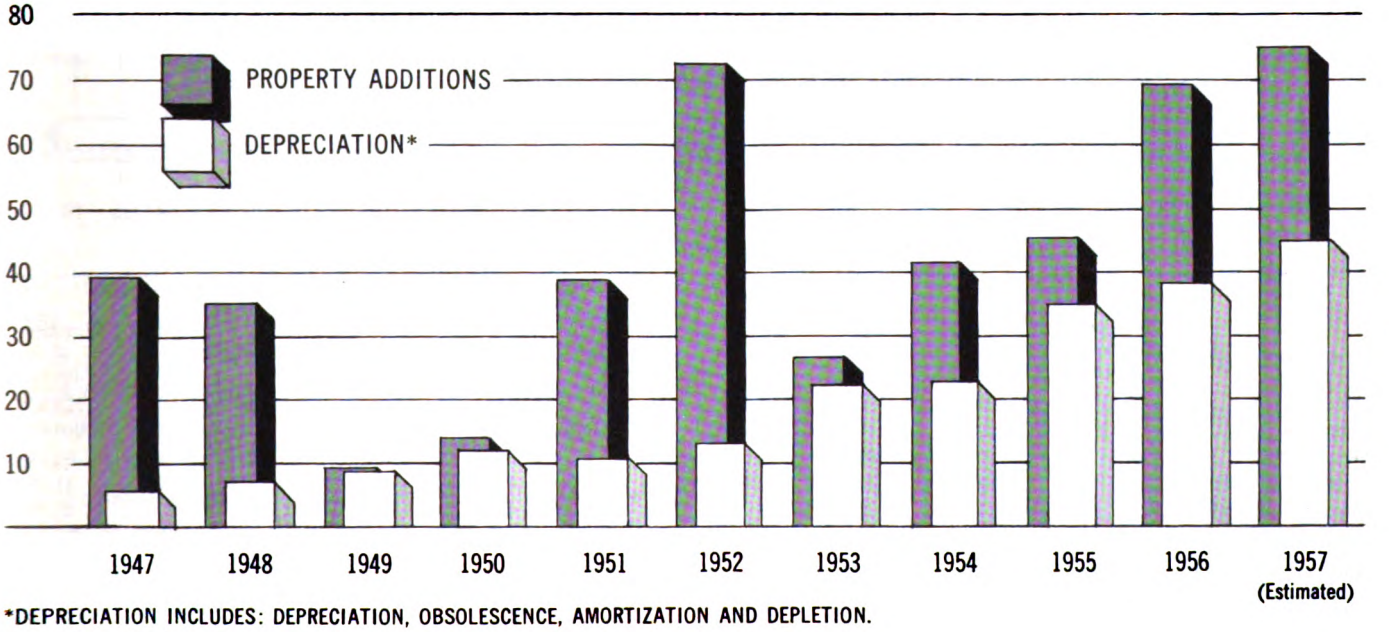
In June, Sir Miles Thomas became chairman of Monsanto Chemicals Limited, succeeding E. A. O'Neal Jr., who had been elected president of Chemstrand. Sir Miles, formerly chairman of British Overseas Airways and pre-war managing director of Morris Motors, Limited, brings to our British associate contacts and talents which will be most helpful to its continued progress.

EMPHASIS CONTINUES ON RESEARCH

In the chemical industry much effort and expense can or cannot be included within research, depending upon how one defines the word and interprets the definition. Is research any studious inquiry?—Of markets?—Of statistics? Or, in our industry, should the meaning of the word be limited to protracted, systematic investigations of physical or chemical phenomena? And, if the latter, should it embrace also the application of knowledge thus gained? Obviously, there are many gray areas which can be included in or excluded from the category of research by arbitrary decision. No two chemical companies use identical definitions for allocating expenses incurred in their development. For this reason we discontinued some years ago reporting what we consider to be research expense.

In Monsanto, each producing division—Organic, Inorganic, Plastics, Lion Oil—maintains one or more laboratories devoted to finding better ways of doing what it does, seeking new applications or new outlets

GROSS ADDITIONS TO PROPERTY and DEPRECIATION* (in $ millions)



*DEPRECIATION INCLUDES: DEPRECIATION, OBSOLESCENCE, AMORTIZATION AND DEPLETION.
1955, 1956, 1957 INCLUDE LION OIL.

for its existing products, developing processes and uses for new products.

In addition, Monsanto maintains a central laboratory in Dayton, Ohio, where physical and chemical phenomena are studied and applied for the long-range benefit of the producing divisions. This laboratory is operated by the Research and Engineering Division, which is carrying on work there and elsewhere to gain new knowledge. For instance, it is seeking new phenomena by pioneering the use, in chemical reactions, of temperatures nearly as high as those on the surface of the sun, as low as 450°F below zero, of extremely high pressures, of near-perfect vacuums, of light, of inaudible sounds, of high intensity radiation.

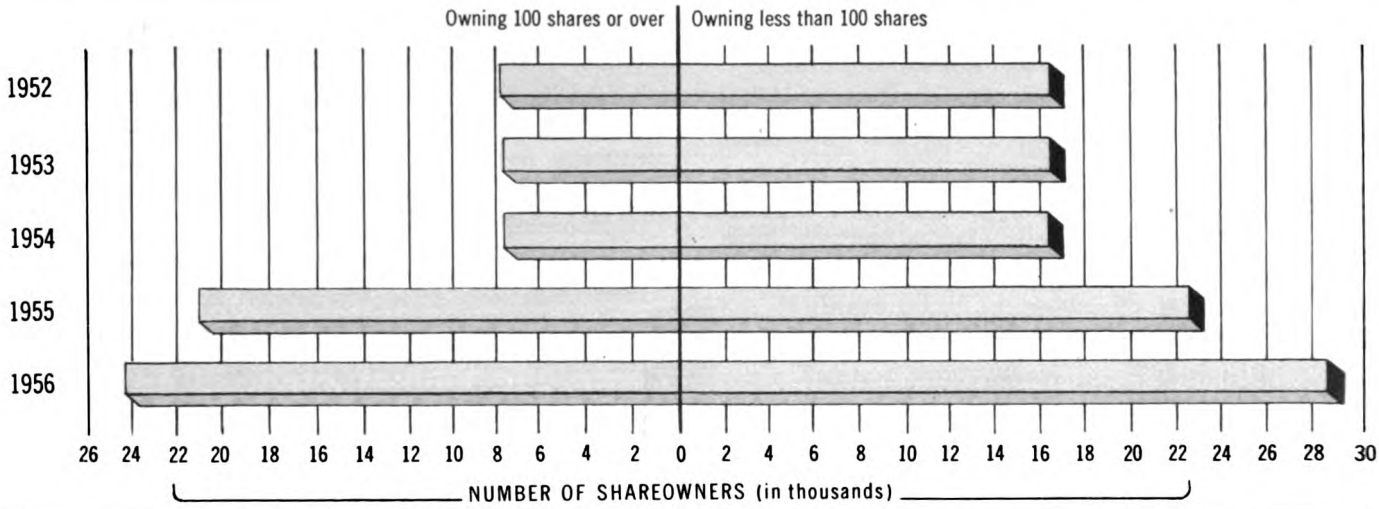
One outcome of such work has been the synthesis and formulation of organic compounds suitable for use at temperatures up to 700°F. In a similar way, organic compounds especially suitable as heat-transfer fluids for nuclear power reactors have been prepared and tested in cooperation with the United States Navy.

And in more prosaic fields the Research and Engineering Division is seeking, among other objectives, to find the causes of corrosion and how and with what to avoid it. Standardization of engineering equipment has led to increased efficiency, lower capital costs, lower maintenance charges.

The division also is seeking knowledge of why reactions happen and under what exact conditions the most desired result can be obtained; such studies are concerned with what is called the mechanism and kinetics of reactions. The results are adding new knowledge, even in processes using long-established reactions. For example, such fundamental studies of the kinetics of sulfuric acid formation have resulted in process improvement and new knowledge, through the use of which cheaper plants with greater effectiveness can be designed.

Although the IBM-702 digital computer was originally justified by our company for speedier accounting service, it is now being used very extensively for the solution of technical problems. Such examples as ideal conditions for distillation, chemical-biological coordi-

SHAREOWNERS OF RECORD



	1956		1955		1954		1953		1952	
	Number of Share-owners	Number of Shares	Number of Share-owners	Number of Shares	Number of Share-owners	Number of Shares	Number of Share-owners	Number of Shares	Number of Share-owners	Number of Shares
Men	20,412	4,788,326	16,239	4,536,291	8,572	1,002,957	8,740	1,096,300	8,706	1,113,698
Women	18,433	3,667,225	15,431	3,627,534	9,135	883,346	9,164	914,927	9,169	919,896
Joint Accounts	7,641	563,826	4,925	465,640	1,729	62,279	1,763	63,433	1,810	66,495
Charitable Institutions	145	147,082	154	133,830	133	44,429	130	46,132	124	41,759
Educational Institutions	117	117,618	105	126,631	89	40,414	87	44,324	87	43,261
Estates and Trusts	4,155	2,722,940	3,633	2,634,281	3,099	791,615	3,114	793,491	3,085	803,568
Insurance Companies	180	793,439	168	780,424	152	254,374	156	254,636	156	260,016
Brokers and Nominees	971	7,723,290	1,389	7,738,397	894	2,022,934	850	1,874,098	851	1,825,884
All Others	964	922,715	647	955,917	419	167,703	411	182,710	416	193,612
	53,018	21,446,461	42,691	20,998,945	24,222	5,270,051	24,415	5,270,051	24,404	5,268,189

nation, correlation in agricultural chemicals testing, and optimum conditions for ethylene polymerization, illustrate the nature of the problems for the solution of which the computer is now employed. Analogue computers are better adapted to the solution of some technical problems. A suitable analogue machine is being constructed for us.

Throughout the parent company alone there were at the year end 1,272 people engaged in research laboratories, of whom 774 were scientists. In addition, 145 were engaged in patent and development work, of whom 80 were technical and legal graduates. There were also 252 technical graduates in engineering departments. Excluding charges for general administrative overhead, last year's cost of the efforts of these people, including only uncapitalized engineering development, amounted to $19,216,091—an increase of $3,358,581 over the amount so expended in 1955. For 1957 a larger staff will be so employed; a larger sum has been budgeted; and more knowledge and profitable applications of that knowledge should result.

Similar work is carried on by Monsanto Chemicals Limited. And excellent results are forthcoming from Monsanto Canada Limited, a small research laboratory having been activated in Montreal a few years ago. Another small research laboratory was established recently in Zurich, Switzerland, where continental scientists will be engaged in fundamental studies of physical and chemical phenomena.

Early in 1957, the Research and Engineering Division will establish at Everett, Massachusetts, a laboratory to conduct government-sponsored research on problems concerning national defense and welfare.

CAPITAL OUTLAYS

Capital expenditures of subsidiaries, the parent company and its proportional share of such expenditures by associated companies totaled $98,717,000.

Of this sum our share of associated companies' capital outlays was $21,672,000; our unconsolidated subsidiaries spent $7,806,000 and of the balance, $14,657,000 was the capitalized portion of Lion Oil Company Division expenditures for oil and gas properties and their development.

Accomplishments occasioned by these expenditures have been reviewed in earlier pages.

For 1957, about $75,000,000 of capital expenditures have been budgeted by the parent company and its consolidated subsidiaries. In addition it is estimated that our unconsolidated subsidiaries will expend $10,000,000 and our share of associated companies' expenditures will be $32,000,000.

Major items of the parent company include the expansion and improvement of Texas City's polyethylene facilities, additions to plastic plants in Springfield and Cincinnati, and a new phenol plant at Monsanto, Illinois. In addition to many smaller projects, the budget includes the cost of completing those which were started in earlier years. Capital items for our petroleum operations are estimated to approximate those of last year.

A NEW APPROACH TO SHAREOWNER REPORTING

Last year our annual report was a pictorial and financial presentation. It met with the favor of many, probably most, of our shareowners. As in most widely held companies, a great many of Monsanto's 53,000 shareowners are women; many are employes. These groups commented favorably on the format.

Financial analysts, however, were critical of the pictorial emphasis and of the lack of comparative financial data such as had appeared in prior reports. This omission was due to the unavailability of such comparative data, the Lion Oil merger having been consumated but three months prior to the year end.

To heed what we believe to be the desires of both groups, this report is issued in two sections: a pictorial review and this review which includes the comprehensive statistics which follow. Incidentally, the combined per-copy cost of the two booklets is no greater than the per-copy cost of last year's single report.

As this innovation has resulted from comments and suggestions regarding earlier efforts, we shall welcome comments, suggestions and criticisms respecting this one, as well as inquiries concerning any other aspect of your company's affairs.

Sincerely,

Chairman of the Board

President

St. Louis, Missouri
March 1, 1957

MONSANTO CHEMICAL COMPANY AND CONSOLIDATED SUBSIDIARIES

Sales by Product Groups

	1956 %	1955 %	1951 %
Plastics, Synthetic Resins and Surface Coatings	31.5	29.4	28.8
Phosphate Products and Detergents	18.2	18.3	15.7
Intermediates, Plasticizers and Resins	13.0	14.0	15.7
Wood Preservatives and Agricultural Chemicals	9.2	10.0	4.7
Petroleum Products—net of purchases	8.8	9.3	
Rubber and Oil Chemicals	6.8	6.9	11.4
Heavy Chemicals	4.4	4.3	6.3
Pharmaceuticals, Flavors and Condiments	3.7	3.7	10.2
Other	4.4	4.1	7.2
	100.0	100.0	100.0

MONSANTO CHEMICAL COMPANY

Sales to Public and Consuming Industries

	1956		1955	
	Position	% of Total	Position	% of Total
Public—Service station sales, "*all*", etc.	1	12.40	1	12.60
Plastics and Resins	2	10.79	4	9.98
Rubber	3	9.71	2	10.49
Petroleum	4	9.70	3	10.15
Agriculture	5	7.90	5	9.45
Soap and Detergent	6	7.48	6	7.31
Metal	7	6.38	9	4.35
Stone, Glass and Vitreous Product	8	6.09	7	6.15
Paint, Varnish and Printing Ink	9	4.08	8	5.43
Textile	10	3.90	10	3.52
Pharmaceutical	11	3.60	13	2.75
Paper and Printing	12	3.59	12	2.83
Food	13	3.56	11	3.36
Lumber and Timber	14	2.82	14	2.54
Iron, Steel and Related Product	15	1.49	15	2.09
Transportation Equipment	16	1.24	18	1.01
Color and Dyestuff	17	1.06	17	1.16
Non-ferrous Metal	18	.87	16	1.28
Other		3.34		3.55
		100.00		100.00

EXPLANATION OF HISTORICAL DATA

In 1955's annual report we presented for the first time, comparative consolidated financial statements and other data of Monsanto Chemical Company and its domestic and foreign subsidiaries, together with that portion of the assets, liabilities, sales, income, employes, additions to property and other data, which were represented by our ownership in 50 per cent owned enterprises.

This was done because a substantial part of Monsanto's investment and growth, particularly in post-war years, has been in companies owned jointly with other corporate partners and in overseas subsidiaries which are not reflected fully in Monsanto's audited balance sheets and income statements.

Hence similar statements and data are presented this year on the pages which follow.

Included in these consolidations are our proportionate 50 per cent interests in The Chemstrand Corporation, Shawinigan Resins Corporation, Mobay Chemical Company, Monsanto Boussois (France), Monsanto Kasei (Japan) and the following active subsidiaries:

Monsanto Export Company
Monsanto Canada Limited and subsidiary
Monsanto Mexicana, S. A.
Monsanto Overseas, S. A. (Panama)
Monsanto Chemicals Limited and British subsidiaries
Monsanto Chemicals (Australia) Limited
Monsanto Argentina, S. A. I. C.
Monsanto Chemicals of India Private Limited
L-M Oil Company, Ltd. (Canada)
Subsidiaries participating in Sicilian oil ventures.

In the years when such enterprises suffered losses, income taxes were reduced in the statements by the amounts they would have been reduced had our portion of the operation been an integral part of the parent company. Conversely when such companies started returning a profit the income taxes shown in the consolidation were not reduced because of the loss carry-over as was the case in the individual enterprise. All the enterprises operated profitably in 1956 with the exception of Mobay, Monsanto Argentina, L-M Oil Company and the Sicilian operations, all of which are in development stages.

All earnings of the consolidated subsidiaries and associated companies are available for dividends with the exception of Chemstrand, which dividends are limited to the terms of its indenture, and in some foreign nations dividends are subject to exchange controls. However, assuming that all such earnings had been received as dividends, we have included in each year's income taxes an estimated provision for additional income and corporate dividend taxes which would have been payable.

All dollar amounts are stated in millions except those relating to book values, per share earnings and capital per employe. Foreign currencies are taken at exchange rates ruling at each year's end.

MONSANTO CHEMICAL COMPANY AND DOMESTIC AND F

Consolidating Only That Percentage of Assoc

(*In Millions of Dollars*)

ASSETS

	1956	1955	1954	1953	1952	10 YEARS AGO 1946	25 YEARS AGO 1931
Current Assets:							
Cash	$ 32.9	$ 59.3	$ 43.9	$ 49.9	$ 57.4	$ 13.7	$ 1.1
Marketable securities	21.7	24.4	4.9	14.2	20.3	32.3	1.1
Receivables, less reserves	86.1	72.4	50.5	40.9	42.6	16.2	1.0
Inventories	113.9	100.0	75.0	74.2	64.7	20.8	2.7
	$254.6	$256.1	$174.3	$179.2	$185.0	$ 83.0	$ 5.9
Investments, etc.	$ 7.9	$ 6.4	$ 4.0	$ 5.1	$ 4.6	$ 1.6	$ .3
Property:							
Land	$ 11.5	$ 10.7	$ 7.2	$ 6.7	$ 6.3	$ 3.4	$ 1.1
Buildings	114.5	98.0	78.3	69.5	60.9	20.6	3.6
Machinery and equipment	505.7	455.6	341.0	304.3	259.8	74.1	11.0
Phosphate deposits	5.9	5.6	5.0	4.6	4.4	.8	
Producing oil and gas properties	64.6	59.5					
Undeveloped oil and gas leaseholds	15.1	10.4					
	$717.3	$639.8	$431.5	$385.1	$331.4	$ 98.9	$15.7
Less reserves for depreciation, etc.	248.8	219.1	134.6	110.1	92.2	46.2	4.5
Net property	$468.5	$420.7	$296.9	$275.0	$239.2	$ 52.7	$11.2
Deferred Charges	$ 7.2	$ 7.0	$ 5.8	$ 4.9	$ 3.5	$ .7	$ .2
	$738.2	$690.2	$481.0	$464.2	$432.3	$138.0	$17.6

See explanation, page 11.

N SUBSIDIARY AND 50% OWNED ASSOCIATED COMPANIES

panies which is Represented by Monsanto Ownership

(*In Millions of Dollars*)

LIABILITIES

	1956	1955	1954	1953	1952	10 YEARS AGO 1946	25 YEARS AGO 1931
Current Liabilities:							
Accounts payable and accruals	$ 60.3	$ 52.8	$ 38.6	$ 33.7	$ 37.8	$ 15.4	$ 1.4
Income taxes less tax notes	25.5	13.2			2.1	2.3	.1
Sinking funds and notes payable	6.0	3.1	1.8	1.0	1.0	.3	
	$ 91.8	$ 69.1	$ 40.4	$ 34.7	$ 40.9	$ 18.0	$ 1.5
Bonus Payable After One Year	$ 1.8	$ 1.8	$ 1.2	$ 1.5	$ 1.6		
Long Term Debt	$214.9	$221.4	$161.8	$161.8	$135.7	$ 30.0	$ 1.6
Reserves:							
Future taxation	$ 16.2	$ 10.2	$ 5.0	$ 4.5	$ 3.6		
Pensions, contingencies, etc.	4.2	4.4	5.2	6.1	6.9	$ 5.4	$ .5
Employes' bonus—unawarded	1.2	.9	.7	.7	.9		
	$ 21.6	$ 15.5	$ 10.9	$ 11.3	$ 11.4	$ 5.4	$ .5
Capital Stock and Surplus:							
Minority interests in subsidiaries	$ 7.9	$ 7.5	$ 8.6	$ 8.2	$ 8.8	$ .9	
Preference stocks	10.2	10.2	26.0	26.0	26.0	33.7	
Common stock	42.9	42.0	26.4	26.4	26.3	19.0	$ 7.2
Paid-in surplus	165.9	151.4	102.6	102.5	102.2	7.5	4.1
Earned surplus	181.2	171.3	103.1	91.8	79.4	23.5	2.7
	$408.1	$382.4	$266.7	$254.9	$242.7	$ 84.6	$14.0
	$738.2	$690.2	$481.0	$464.2	$432.3	$138.0	$17.6

MONSANTO CHEMICAL COMPANY AND DOMESTIC AND FC

Consolidating Only That Percentage of Associ

(In Millions of Dollars, Except Per Share Earnings)

	1956	1955	1954	1953	1952	10 YEARS AGO 1946	25 YEARS AGO 1931
Income:							
Net sales	$653.8	$630.4	$407.6	$380.2	$303.3	$113.0	$13.1
Other	3.7	2.5	2.5	3.0	3.3	1.7	.2
	$657.5	$632.9	$410.1	$383.2	$306.6	$114.7	$13.3
Deductions:							
Cost of goods sold	$467.7	$434.9	$291.6	$271.2	$216.7	$ 80.9	$ 9.8
Selling, administrative, research	88.1	83.0	62.1	53.6	40.2	13.2	1.8
Provision for employes' bonus	1.4	2.2	.6	1.2	.6		
Income charges	11.5	11.4	8.2	7.2	7.7	.9	.2
Minority interests	.9	1.0	1.0	.9	.5	.2	
	$569.6	$532.5	$363.5	$334.1	$265.7	$ 95.2	$11.8
Income Before Income Taxes	$ 87.9	$100.4	$ 46.6	$ 49.1	$ 40.9	$ 19.5	$ 1.5
Provision for Income Taxes	42.1	50.1	21.4	23.5	18.6	8.6	.2
Net Income	$ 45.8	$ 50.3	$ 25.2	$ 25.6	$ 22.3	$ 10.9	$ 1.3
Per Common Share[1]	$ 2.13	$ 2.37	$ 1.56	$ 1.58	$ 1.37	$ .95	$ .17

See explanation, page 11.

(1) Adjusted for splits.

N SUBSIDIARY AND 50% OWNED ASSOCIATED COMPANIES

panies which is Represented by Monsanto Ownership

(*Amounts in Millions, Except Where Italicized*)

	1956	1955	1954	1953	1952	10 YEARS AGO 1946	25 YEARS AGO 1931
Depreciation, depletion, etc.	$ 46.8	$ 44.7	$ 30.8	$ 25.9	$ 15.7	$ 4.6	$ 1.0
Book value of common stock [1]	*$ 18.18*	*$ 17.37*	*$ 14.68*	*$ 13.96*	*$ 13.15*	*$ 4.46*	*$ 1.80*
Gross additions to property	$ 98.7	$ 61.8	$ 53.3	$ 63.0	$ 96.1	$ 23.6	$ 1.7
Employes [2]	*27,547*	*26,621*	*21,608*	*20,526*	*19,069*	*13,510*	*2,130*
Working capital	$ 162.8	$ 187.0	$ 133.9	$ 144.5	$ 144.1	$ 65.0	$ 4.4
Employed capital [3]	$ 623.0	$ 603.8	$ 428.5	$ 416.7	$ 378.4	$114.6	$ 15.6
Employed capital per employe	*$22,616*	*$22,681*	*$19,831*	*$20,301*	*$19,844*	*$8,483*	*$7,324*
Parent company:							
Cash dividends on common shares	$ 21.0	$ 20.3	$ 13.1	$ 13.1	$ 12.9	$ 4.1	$ .5
Shares outstanding:							
Preference			*150,000*	*150,000*	*150,000*	*316,822*	
Common [1]	21.4	21.0	15.8	15.8	15.8	11.4	*7.7*
Number of shareowners	*53,018*	*42,691*	*24,222*	*24,415*	*24,404*	*11,616*	*3,701*

(1) Adjusted for splits. (2) Excluding employes of government plants. (3) Net worth and long term debt.

FINANCIAL REVIEW

Consolidated financial statements which combine the accounts of Monsanto Chemical Company and its domestic and Canadian subsidiary companies and which are presented on pages 18 through 21 should be read in conjunction with the following comments and explanations.

Foreign subsidiaries, other than Canadian, are not included in these statements. These, together with our 50 per cent interests in associated companies, are included in the consolidations which appear on pages 12 through 15.

Comparative consolidated net sales and net income by quarters were:

	(In thousands of dollars)		Per cent Increase *Decrease*
Sales:	1956	1955	
First quarter	$140,611	$132,708	6.0
Second quarter	139,646	133,496	4.6
Third quarter	127,124	124,631	2.0
Fourth quarter	134,502	131,514	2.3
	$541,883	$522,349	3.7
Income:			
First quarter	$ 11,255	$ 14,256	*21.1*
Second quarter	10,720	10,287	4.2
Third quarter	6,838	8,226	*16.9*
Fourth quarter	9,833	9,401	4.6
	$ 38,646	$ 42,170	*8.4*
Less preference dividends		553	
Earnings for common	$ 38,646	$ 41,617	*7.1*

Per share earnings were:	1956	1955
First quarter	$ .53	$ .67
Second quarter	.50	.49
Third quarter	.32	.38
Fourth quarter	.45	.44
Year	$1.80	$1.98
Shares outstanding December 31	21,446,461	20,998,945

Outstanding common shares were increased by the year-end two per cent stock dividend and 27,000 shares purchased by employes under options.

Favorable fourth quarter adjustments were greater in 1956 than in 1955 but in keeping with those of prior years.

Our equity in the net assets of

Unconsolidated subsidiaries was	$16,801,000
And in 50% owned companies was	46,767,000
Totaling	$63,568,000
Which exceeded our carrying value of	36,503,000
By	$27,065,000

Our equity in the unaudited net income for the year 1956 of the unconsolidated subsidiaries was approximately $2,192,000 and of the 50 per cent owned companies, $5,719,000. Dividends of $1,026,730 were received from these companies in 1956 and have been included in income.

Charges to income in 1956 for depreciation and obsolescence were $35,621,263 and for depletion of mines and wells, $2,827,921. In 1955, such charges were $32,168,056 and $2,861,018.

The sum of the years digits method of computing depreciation for both book and tax purposes was continued. This method was adopted by Monsanto in 1954 on property additions subsequent to December 31, 1953, and by Lion Oil division on property additions subsequent to December 31, 1955. The additional depreciation provided by this method over the normal straight line method increased from $2,182,225 in 1955 to $3,653,914.

Inventories at December 31, 1956, are valued substantially at the lower of cost or market, the valuation of approximately one-fifth of the inventories being determined on the last-in, first-out basis. The annual rates of inventory turnover were 4.5 in 1956 and 4.7 in 1955.

The sinking fund payment on the 2.65% debentures due May 1, 1957, was anticipated by the purchase of $1 million of these debentures.

During 1956, four quarterly cash dividends of 25 cents each were paid on the common stock. Also, as in 1955, a stock dividend of two per cent was paid in December. Such cash dividends in 1956 aggregated $21 millions, compared with $20.3 millions in 1955. The latter figure includes $4.6 millions paid by Lion Oil prior to its merger into Monsanto.

Monsanto has two stock option plans: the Stock Option Plan originally authorized by shareowners in 1951 for key employes and the Employes' Stock Plan, authorized by shareowners in 1956 for all hourly and salaried employes, excepting participants of the preceding plan. The status of each on January 1 and December 31, and the changes occurring during the year, were:

	Stock Option Plan	Employes' Stock Plan
Shares issuable under options outstanding January 1	503,947	—0—
Unoptioned shares available January 1	261,925	—0—
Shares optioned during year	55,410	305,400
Shares exercised during year	27,000	—0—
Shares in unexercised options which expired	7,650	2,554
Shares issuable under options outstanding December 31	535,168*	302,846
Unoptioned shares available December 31	218,479*	—0—

*Adjusted to reflect the 1956 two per cent stock dividend.

Under the Stock Option Plan 114 options are outstanding, at prices ranging from $27.71 to $45.96 a share, the prices having been adjusted for the 1955 three-for-one split and the 1955 and 1956 stock dividends of two per cent each. Under the 1956 Employes' Stock Plan, 400,000 Monsanto shares were allotted employes at $38.50 a share, being 95 per cent of the New York Stock Exchange average price on September 7, the date on which the Plan became effective. No officers, directors or others participating in the 1951 Plan were eligible for the Employes' Stock Plan. Subscriptions by 7,872 employes covered 305,400 shares. Payments over three years are made by payroll deductions on which the company credits interest at three and a half per cent. Sixty-four per cent of the eligible salaried employes and 25 per cent of the eligible hourly employes subscribed, a gratifying response when compared with the experiences of other companies' initial offers under similar plans, and particularly so when one considers that during the subscription period the market price of Monsanto shares declined substantially below the option price.

MONSANTO CHEMICAL COMPAN

Statement of Consolidated Financi

ASSETS

	1956	1955	Increase Decrease
Current Assets:			
Cash	$ 27,228,127	$ 43,439,543	$16,211,416
Marketable securities	10,923,332	3,980,473	6,942,859
Receivables, less reserves of $1,309,783 in 1956 and $1,191,372 in 1955	63,984,980	56,652,637	7,332,343
Inventories	92,667,188	81,354,271	11,312,917
	$194,803,627	$185,426,924	$ 9,376,703
Investments and Miscellaneous Assets:			
Investment in unconsolidated subsidiaries	$ 2,524,570	$ 2,510,787	$ 13,783
Investment in, advances to associates	33,978,692	36,378,242	2,399,550
Common capital stock held for bonus awards	1,170,639	1,191,792	21,153
Miscellaneous investments and receivables	5,095,130	4,071,055	1,024,075
	$ 42,769,031	$ 44,151,876	$ 1,382,845
Property, Plant and Equipment	$566,830,022	$517,319,937	$49,510,085
Less—Reserves for depreciation and depletion	212,386,053	189,537,824	22,848,229
Net property	$354,443,969	$327,782,113	$26,661,856
Patents and Processes	$ 1	$ 1	
Deferred Charges	5,715,670	5,175,625	$ 540,045
Total	$597,732,298	$562,536,539	$35,195,759

The above statement should be read in conjunction with pages 16 and 17 of this report.

ND CONSOLIDATED SUBSIDIARIES

sition at December 31, 1956 and 1955

LIABILITIES

	1956	1955	Increase Decrease
Current Liabilities:			
Estimated income taxes	$ 22,063,205	$ 28,949,048	$ 6,885,843
Less—United States Government securities	4,211,593	23,647,546	19,435,953
Net estimated income tax liability	$ 17,851,612	$ 5,301,502	$12,550,110
Accounts payable and accruals	46,332,353	43,342,133	2,990,220
Sinking fund payments due within one year, less $1,000,000 debentures in treasury in 1956	1,750,000	1,750,000	
	$ 65,933,965	$ 50,393,635	$15,540,330
Employes' Bonus Awards Payable Beyond One Year	$ 1,804,017	$ 1,778,648	$ 25,369
Long Term Debt (Less current portion above):			
3¼% Debentures, due 1968	$ 17,500,000	$ 18,750,000	$ 1,250,000
2.65% Debentures, due 1971	29,000,000	30,000,000	1,000,000
3⅝% Debentures, due 1972	13,500,000	14,000,000	500,000
3¾% Income Debentures, due 2002	91,000,000	91,000,000	
Canadian subsidiary	700,000	700,000	
	$151,700,000	$154,450,000	$ 2,750,000
Reserves:			
Deferred income taxes	$ 10,764,317	$ 5,995,317	$ 4,769,000
Pensions	3,378,310	4,237,038	858,728
Employes' bonus—unawarded	957,730	939,825	17,905
	$ 15,100,357	$ 11,172,180	$ 3,928,177
Capital Stock and Surplus:			
Common stock—authorized, 25,000,000 shares, par value $2 each; reserved for stock options, 838,014 shares in 1956 and 503,947 shares in 1955; outstanding, 21,446,461 shares in 1956 and 20,998,945 shares in 1955	$ 42,892,922	$ 41,997,890	$ 895,032
Surplus:			
Paid-in	157,328,247	142,323,874	15,004,373
Earned	162,972,790	160,420,312	2,552,478
	$363,193,959	$344,742,076	$18,451,883
Total	$597,732,298	$562,536,539	$35,195,759

MONSANTO CHEMICAL COMPAN

Statement of Consolidated Income
for the Years Ended December 31, 1956 and 1955

	1956	1955	Increase Decrease
Income:			
Net sales	$541,883,474	$522,349,097	$19,534,377
Dividends from subsidiary and associated companies	1,026,730	984,171	42,559
Other	3,956,646	2,346,162	1,610,484
	$546,866,850	$525,679,430	$21,187,420
Deductions:			
Cost of goods sold	$394,752,477	$365,505,883	$29,246,594
Selling, administrative and research expenses	73,427,031	70,870,589	2,556,442
Provision for employes' bonus	1,220,061	1,985,062	765,001
Interest expense	5,420,155	4,885,616	534,539
Other	2,637,593	3,364,310	726,717
	$477,457,317	$446,611,460	$30,845,857
Income Before Provision for Income Taxes	$ 69,409,533	$ 79,067,970	$ 9,658,437
Provision for Income Taxes:			
Current	$ 25,995,000	$ 32,068,391	$ 6,073,391
Deferred	4,769,000	4,829,609	60,609
	$ 30,764,000	$ 36,898,000	$ 6,134,000
Net Income	$ 38,645,533	$ 42,169,970	$ 3,524,437

The above statement should be read in conjunction with pages 16 and 17 of this report.

D CONSOLIDATED SUBSIDIARIES

Statement of Consolidated Surplus
for the Years Ended December 31, 1956 and 1955

	1956	1955
PAID-IN SURPLUS		
Balance at Beginning of Year	$142,323,874	$ 93,620,099
Additions:		
Excess of stated value of common stock of Lion Oil Company outstanding at the time of merger over the par value of common capital stock issued in exchange therefor		32,639,786
Excess of approximate market value of common capital stock distributed as stock dividends over the par value thereof	14,259,680	17,441,476
Excess of amounts received over the par value of common capital stock issued under stock option plan	744,693	2,495,813
Excess of minority interest acquired in subsidiary company over the par value of common capital stock issued therefor		1,410,667
	$157,328,247	$147,607,841
Deduction—Transfer to common capital stock account in connection with the 3 for 1 split of common stock and the reduction of the par value from $5 to $2 a share		5,283,967
Balance at End of Year	$157,328,247	$142,323,874
EARNED SURPLUS		
Balance at Beginning of Year	$160,420,312	$157,915,826
Add—Net income for the year	38,645,533	42,169,970
	$199,065,845	$200,085,796
Deductions:		
Dividends on capital stock:		
Cash:		
Preference—Series C		$ 457,125
Common	$ 20,992,343	15,707,025
Lion Oil Company prior to merger		4,636,370
	$ 20,992,343	$ 20,800,520
Stock dividends of 2% on common capital stock	15,100,712	18,264,964
Premium paid on redemption of Series C Preference Stock		600,000
	$ 36,093,055	$ 39,665,484
Balance at End of Year	$162,972,790	$160,420,312

The above statement should be read in conjunction with pages 16 and 17 of this report.

MONSANTO CHEMICAL COMPANY AND DOMESTIC AND FO

Consolidating Only That Percentage of Associ

(*In Millions of Dollars, Except Per Share Earnings*)

	1956	1955	1954	1953	1952	10 YEARS AGO 1946	25 YEARS AGO 1931
Income:							
Net sales	$653.8	$630.4	$407.6	$380.2	$303.3	$113.0	$13.1
Other	3.7	2.5	2.5	3.0	3.3	1.7	.2
	$657.5	$632.9	$410.1	$383.2	$306.6	$114.7	$13.3
Deductions:							
Cost of goods sold	$467.7	$434.9	$291.6	$271.2	$216.7	$ 80.9	$ 9.8
Selling, administrative, research	88.1	83.0	62.1	53.6	40.2	13.2	1.8
Provision for employes' bonus	1.4	2.2	.6	1.2	.6		
Income charges	11.5	11.4	8.2	7.2	7.7	.9	.2
Minority interests	.9	1.0	1.0	.9	.5	.2	
	$569.6	$532.5	$363.5	$334.1	$265.7	$ 95.2	$11.8
Income Before Income Taxes	$ 87.9	$100.4	$ 46.6	$ 49.1	$ 40.9	$ 19.5	$ 1.5
Provision for Income Taxes	42.1	50.1	21.4	23.5	18.6	8.6	.2
Net Income	$ 45.8	$ 50.3	$ 25.2	$ 25.6	$ 22.3	$ 10.9	$ 1.3
Per Common Share[1]	$ 2.13	$ 2.37	$ 1.56	$ 1.58	$ 1.37	$ .95	$ .17

See explanation, page 11.

(1) Adjusted for splits.

SUBSIDIARY AND 50% OWNED ASSOCIATED COMPANIES

panies which is Represented by Monsanto Ownership

(*Amounts in Millions, Except Where Italicized*)

	1956	1955	1954	1953	1952	10 YEARS AGO 1946	25 YEARS AGO 1931
Depreciation, depletion, etc.	$ 46.8	$ 44.7	$ 30.8	$ 25.9	$ 15.7	$ 4.6	$ 1.0
Book value of common stock [1]	*$ 18.18*	*$ 17.37*	*$ 14.68*	*$ 13.96*	*$ 13.15*	*$ 4.46*	*$ 1.80*
Gross additions to property	$ 98.7	$ 61.8	$ 53.3	$ 63.0	$ 96.1	$ 23.6	$ 1.7
Employes [2]	*27,547*	*26,621*	*21,608*	*20,526*	*19,069*	*13,510*	*2,130*
Working capital	$ 162.8	$ 187.0	$ 133.9	$ 144.5	$ 144.1	$ 65.0	$ 4.4
Employed capital [3]	$ 623.0	$ 603.8	$ 428.5	$ 416.7	$ 378.4	$114.6	$ 15.6
Employed capital per employe	*$22,616*	*$22,681*	*$19,831*	*$20,301*	*$19,844*	*$8,483*	*$7,324*
Parent company: Cash dividends on common shares	$ 21.0	$ 20.3	$ 13.1	$ 13.1	$ 12.9	$ 4.1	$ .5
Shares outstanding: Preference			*150,000*	*150,000*	*150,000*	*316,822*	
Common [1]	21.4	21.0	15.8	15.8	15.8	11.4	*7.7*
Number of shareowners	53,018	*42,691*	*24,222*	*24,415*	*24,404*	*11,616*	*3,701*

(1) Adjusted for splits. (2) Excluding employes of government plants. (3) Net worth and long term debt.

MONSANTO CHEMICAL COMPAN

Statement of Consolidated Financi

ASSETS

	1956	1955	Increase Decrease
Current Assets:			
Cash	$ 27,228,127	$ 43,439,543	$16,211,416
Marketable securities	10,923,332	3,980,473	6,942,859
Receivables, less reserves of $1,309,783 in 1956 and $1,191,372 in 1955	63,984,980	56,652,637	7,332,343
Inventories	92,667,188	81,354,271	11,312,917
	$194,803,627	$185,426,924	$ 9,376,703
Investments and Miscellaneous Assets:			
Investment in unconsolidated subsidiaries	$ 2,524,570	$ 2,510,787	$ 13,783
Investment in, advances to associates	33,978,692	36,378,242	2,399,550
Common capital stock held for bonus awards	1,170,639	1,191,792	21,153
Miscellaneous investments and receivables	5,095,130	4,071,055	1,024,075
	$ 42,769,031	$ 44,151,876	$ 1,382,845
Property, Plant and Equipment	$566,830,022	$517,319,937	$49,510,085
Less—Reserves for depreciation and depletion	212,386,053	189,537,824	22,848,229
Net property	$354,443,969	$327,782,113	$26,661,856
Patents and Processes	$ 1	$ 1	
Deferred Charges	5,715,670	5,175,625	$ 540,045
Total	$597,732,298	$562,536,539	$35,195,759

The above statement should be read in conjunction with pages 16 and 17 of this report.

ND CONSOLIDATED SUBSIDIARIES

sition at December 31, 1956 and 1955

LIABILITIES

	1956	1955	Increase Decrease
Current Liabilities:			
Estimated income taxes	$ 22,063,205	$ 28,949,048	$ 6,885,843
Less—United States Government securities	4,211,593	23,647,546	19,435,953
Net estimated income tax liability	$ 17,851,612	$ 5,301,502	$12,550,110
Accounts payable and accruals	46,332,353	43,342,133	2,990,220
Sinking fund payments due within one year, less $1,000,000 debentures in treasury in 1956	1,750,000	1,750,000	
	$ 65,933,965	$ 50,393,635	$15,540,330
Employes' Bonus Awards Payable Beyond One Year	$ 1,804,017	$ 1,778,648	$ 25,369
Long Term Debt (Less current portion above):			
3¼% Debentures, due 1968	$ 17,500,000	$ 18,750,000	$ 1,250,000
2.65% Debentures, due 1971	29,000,000	30,000,000	1,000,000
3⅝% Debentures, due 1972	13,500,000	14,000,000	500,000
3¾% Income Debentures, due 2002	91,000,000	91,000,000	
Canadian subsidiary	700,000	700,000	
	$151,700,000	$154,450,000	$ 2,750,000
Reserves:			
Deferred income taxes	$ 10,764,317	$ 5,995,317	$ 4,769,000
Pensions	3,378,310	4,237,038	858,728
Employes' bonus—unawarded	957,730	939,825	17,905
	$ 15,100,357	$ 11,172,180	$ 3,928,177
Capital Stock and Surplus:			
Common stock—authorized, 25,000,000 shares, par value $2 each; reserved for stock options, 838,014 shares in 1956 and 503,947 shares in 1955; outstanding, 21,446,461 shares in 1956 and 20,998,945 shares in 1955	$ 42,892,922	$ 41,997,890	$ 895,032
Surplus:			
Paid-in	157,328,247	142,323,874	15,004,373
Earned	162,972,790	160,420,312	2,552,478
	$363,193,959	$344,742,076	$18,451,883
Total	$597,732,298	$562,536,539	$35,195,759

MONSANTO CHEMICAL COMPAN

Statement of Consolidated Income
for the Years Ended December 31, 1956 and 1955

	1956	1955	Increase Decrease
Income:			
Net sales	$541,883,474	$522,349,097	$19,534,377
Dividends from subsidiary and associated companies	1,026,730	984,171	42,559
Other	3,956,646	2,346,162	1,610,484
	$546,866,850	$525,679,430	$21,187,420
Deductions:			
Cost of goods sold	$394,752,477	$365,505,883	$29,246,594
Selling, administrative and research expenses	73,427,031	70,870,589	2,556,442
Provision for employes' bonus	1,220,061	1,985,062	765,001
Interest expense	5,420,155	4,885,616	534,539
Other	2,637,593	3,364,310	726,717
	$477,457,317	$446,611,460	$30,845,857
Income Before Provision for Income Taxes	$ 69,409,533	$ 79,067,970	$ 9,658,437
Provision for Income Taxes:			
Current	$ 25,995,000	$ 32,068,391	$ 6,073,391
Deferred	4,769,000	4,829,609	60,609
	$ 30,764,000	$ 36,898,000	$ 6,134,000
Net Income	$ 38,645,533	$ 42,169,970	$ 3,524,437

The above statement should be read in conjunction with pages 16 and 17 of this report.

ND CONSOLIDATED SUBSIDIARIES

Statement of Consolidated Surplus
for the Years Ended December 31, 1956 and 1955

	1956	1955
PAID-IN SURPLUS		
Balance at Beginning of Year	$142,323,874	$ 93,620,099
Additions:		
Excess of stated value of common stock of Lion Oil Company outstanding at the time of merger over the par value of common capital stock issued in exchange therefor		32,639,786
Excess of approximate market value of common capital stock distributed as stock dividends over the par value thereof	14,259,680	17,441,476
Excess of amounts received over the par value of common capital stock issued under stock option plan	744,693	2,495,813
Excess of minority interest acquired in subsidiary company over the par value of common capital stock issued therefor		1,410,667
	$157,328,247	$147,607,841
Deduction—Transfer to common capital stock account in connection with the 3 for 1 split of common stock and the reduction of the par value from $5 to $2 a share		5,283,967
Balance at End of Year	$157,328,247	$142,323,874
EARNED SURPLUS		
Balance at Beginning of Year	$160,420,312	$157,915,826
Add—Net income for the year	38,645,533	42,169,970
	$199,065,845	$200,085,796
Deductions:		
Dividends on capital stock:		
Cash:		
Preference—Series C		$ 457,125
Common	$ 20,992,343	15,707,025
Lion Oil Company prior to merger		4,636,370
	$ 20,992,343	$ 20,800,520
Stock dividends of 2% on common capital stock	15,100,712	18,264,964
Premium paid on redemption of Series C Preference Stock		600,000
	$ 36,093,055	$ 39,665,484
Balance at End of Year	$162,972,790	$160,420,312

The above statement should be read in conjunction with pages 16 and 17 of this report.

HASKINS & SELLS
CERTIFIED PUBLIC ACCOUNTANTS

BOATMEN'S BANK BUILDING
SAINT LOUIS 2

Monsanto Chemical Company:

We have examined the statement of consolidated financial position of Monsanto Chemical Company and its consolidated subsidiary companies as of December 31, 1956 and the related statements of consolidated income and surplus for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the accompanying statement of consolidated financial position and statements of consolidated income and surplus present fairly the financial position of Monsanto Chemical Company and its consolidated subsidiaries at December 31, 1956 and the results of their operations for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Haskins & Sells

February 15, 1957.

PETROLEUM OPERATING DATA

	1956	1955	1954	1953	1952
Expenditures for Exploration	$20,175,034	$13,245,034	$11,095,306	$8,772,697	$9,246,838
Portion Capitalized	$14,656,754	$ 9,452,742	$ 8,983,860	$6,556,565	$5,846,169
Portion Expensed	$ 5,518,280	$ 3,792,292	$ 2,111,446	$2,216,132	$3,400,669
Leaseholds Expired and Abandoned	$ 1,452,725	$ 964,766	$ 1,242,397	$1,479,426	$ 796,575
Number of Producing Wells (Net)	1,098	1,062	937	873	818
Natural Gas Produced—Net MCF[1]	20,906,875	18,622,567	14,490,875	12,269,497	11,192,876
Liquified Pet. Gas Produced—Bbls.	994,517	744,160	662,875	747,672	580,290
Gross Crude Oil Produced—Barrels	9,322,559	9,415,719	8,333,034	7,829,481	7,713,422
Net Crude Oil Produced—Barrels	8,163,161	8,244,486	7,296,572	6,855,173	6,752,544
Average Crude Price Per Barrel	$2.75	$2.74	$2.77	$2.77	$2.55
Domestic Undeveloped Acreage	2,250,591	1,808,552	1,466,878	1,381,930	1,540,174
Producing Acreage	71,800	66,144	56,041	42,073	35,745
Crude Oil Run to Stills—Barrels	8,393,703	9,294,844	8,853,248	8,421,579	7,931,703
Daily Average Crude Oil Runs—Barrels	22,934	25,465	24,255	23,073	21,671
Refinery Production—Barrels	8,943,546	10,180,126	9,557,350	8,848,183	8,389,842
Station Sales—Gallons	116,057,474	109,476,394	104,445,456	100,482,606	102,626,827
Number of Stations	2,128	1,955	1,891	1,884	1,946
Refined Oil Sales—Gallons	372,239,287	411,997,884	376,151,644	363,954,581	368,091,487

[1] Excludes natural gas returned to formations.

MONSANTO CHEMICAL COMPANY AND CONSOLIDATED SUBSIDIARIES

Source and Disposition of Funds

(In Thousands of Dollars)

	Total	1956	1955	1954	1953	1952
Source of Funds:						
Net income	$153,989	$38,646	$ 42,170	$23,700	$26,283	$ 23,190
Lion Oil balance at beginning of year	10,389		10,389			
Provisions for:						
Depreciation, etc.	132,832	38,449	35,029	23,285	22,850	13,219
Deferred income taxes	9,599	4,769	4,830			
Employes' bonus, less current liability	*167*	43	847	*427*	*194*	*436*
Sale of securities:						
3¾% debentures due January 1, 2002	91,000		25,000			66,000
400,000 shares of common stock	38,000					38,000
Common stock issued under stock options	3,479	*799*	2,680			
	$439,121	$82,706	$120,945	$46,558	$48,939	$139,973
Disposition of Funds:						
Dividends paid:						
Preference	$ 2,332		$ 601	$ *577*	$ *577*	$ *577*
Common	80,506	$20,992	20,343	13,148	13,137	12,886
	$ 82,838	$20,992	$ 20,944	$13,725	$13,714	$ 13,463
Redemption of preference stock:						
Parent company	$ 15,600		$ 15,600			
Canadian subsidiary	850		850			
Plant additions and replacements	254,799	$69,239	45,156	$41,302	$26,642	$ 72,460
Investment in associated companies—net	24,762	*2,400*	6,900	6,262	7,500	6,500
Investment in unconsolidated subsidiaries	1,230	14	104	868	*5*	239
Increase—*decrease* in working capital[1]	53,953	3,105	11,661	*5,641*	*7,557*	37,271
Sinking fund payments on debentures	4,500	2,750	1,750			
Other—net	2,244	*1,726*	35	1,255	2,579	101
	$440,776	$91,974	$103,000	$57,771	$57,997	$130,034
Increase—*decrease* in cash and securities	$ *1,655*	$ *9,268*	$ 17,945	$11,213	$ *9,058*	$ 9,939

Italics indicate decrease.

[1] Exclusive of cash and securities.

LITHO. IN U. S. A.

DIRECTORS AND OFFICERS OF MONSANTO CHEMICAL COMPANY

At December 31, 1956

BOARD OF DIRECTORS

Edgar M. Queeny, *Chairman* ..... St. Louis
Thomas H. Barton ..... El Dorado, Ark.
Charles S. Cheston ..... Philadelphia
Francis J. Curtis ..... St. Louis
Fredrick M. Eaton ..... New York
John L. Gillis ..... St. Louis
Carroll A. Hochwalt ..... St. Louis
Trueman M. Martin ..... El Dorado, Ark.
William W. Schneider ..... St. Louis
Charles Allen Thomas ..... St. Louis
Felix N. Williams ..... St. Louis

EXECUTIVE COMMITTEE

Charles Allen Thomas, *Chairman*

Carroll A. Hochwalt — William W. Schneider
Edgar M. Queeny — Felix N. Williams

FINANCE COMMITTEE

Charles S. Cheston, *Chairman*

Thomas H. Barton — Edgar M. Queeny
Fredrick M. Eaton — William W. Schneider
Charles Allen Thomas

Transfer Agent

Guaranty Trust Company of New York

Registrar

The Chase Manhattan Bank

OFFICERS

Edgar M. Queeny ..... *Chairman, Board of Directors*
Charles Allen Thomas ..... *President*
Francis J. Curtis ..... *Vice President*
John L. Gillis ..... *Vice President*
Carroll A. Hochwalt ..... *Vice President*
Trueman M. Martin ..... *Vice President*
William W. Schneider ..... *Vice President*
Felix N. Williams ..... *Vice President*

Roy L. Brandenburger ..... *Vice President*
J. L. Christian ..... *Vice President*
R. K. Mueller ..... *Vice President*
Howard K. Nason ..... *Vice President*
Charles H. Sommer ..... *Vice President*
J. Russell Wilson ..... *Vice President*
Marshall E. Young ..... *Vice President*

Irving C. Smith ..... *Controller*
Edwin J. Putzell Jr. ..... *Secretary*
Edward D. Toland Jr. ..... *Treasurer*

Edwin J. Cunningham ..... *Assistant Controller*
Alfred W. Long ..... *Assistant Controller*
Walter C. Thilking ..... *Assistant Controller*
Earl J. Wipfler ..... *Assistant Controller*
Charles E. Caspari Jr. ..... *Assistant Secretary*
Jeff Davis ..... *Assistant Secretary*
Elliott W. Atkinson ..... *Assistant Treasurer*
John F. Martin ..... *Assistant Treasurer*
J. Robert Matlock ..... *Assistant Treasurer*
Rolla H. Stocke ..... *Assistant Treasurer*

Regional Vice Presidents

Edward W. Gamble Jr. — Victor E. Williams

ANNUAL REPORT

MONSANTO CHEMICAL COMPANY

ST. LOUIS, MISSOURI